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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/788,365	02/21/2001	Tuqiang Ni	015290-517	3359

7590

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EXAMINER

ZERVIGON, RUDY

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 09/10/2002

6

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/788,365

Applicant(s)

NI ET AL.

Examiner

Rudy Zervigon

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1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 February 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____:
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 25 and 26 are rejected under 35 U.S.C. 102(a) as being anticipated by Li et al (USPat. 5,772,771). Li teaches a gas injector (Figure 1A) supplying process gas into a plasma processing chamber (18). The gas injector further comprises a gas injector body (56/64, Figure 1) sized to extend through a chamber wall of the processing chamber. As shown in Figure 1, the distal end of the gas injector body is exposed within the processing chamber. Figure 1A shows that the gas injector body includes a plurality of angled gas outlets (64) adapted to supply process gas into the processing chamber. Figures 1 and 1A shows that the gas outlets (64, Figure 1) of the gas injector body (56, Figure 1) are located at an axial end surface (56) of the gas injector body

3. Claims 25, 26, 29, 33, and 34 are rejected under 35 U.S.C. 102(a) as being anticipated by applicant's own admitted prior art to Ishii (USPat. 5,685,942). Ishii teaches a gas injector (85, Figure 4) supplying process gas into a plasma processing chamber (82). The gas injector further comprises a gas injector body (85, Figure 4) sized to extend through a chamber wall (83) of the processing chamber. As shown in Figure 4, the distal end (surface at 87) of the gas injector body is exposed within the processing chamber. Figure 4 shows that the gas injector body includes a plurality of gas outlets (87) adapted to supply process gas into the processing chamber. Figures 4

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shows that the gas outlets of the gas injector body (85, Figure 4) are located at an axial end surface (87) of the gas injector body. Ishii further teaches that the gas injector includes a planar axial end face (Surface of 87, Figure 4) that is flush with an interior surface of a dielectric window (83; "insulating material"; column 8, line 7) forming a chamber wall. Ishii also teaches a surface (flange portion of 85, Figure 4) adapted to overlie an outer surface of the chamber wall.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

5. Claims 25-28, 30, 31, 32, and 35 are rejected under 35 U.S.C. 102(e) as being anticipated by McMillin et al (USPat. 6,013,155). McMillin teaches a gas injector (250, Figure 19b) supplying process gas, at sonic velocity (column 7, lines 55-61), into a plasma processing chamber (140, Figure 2a). The gas injector further comprises a gas injector body (250, Figure 19b) sized to extend through a chamber wall (155) of the processing chamber. As shown in Figure 19b, the distal end (220) of the gas injector body is exposed within the processing chamber. Figure 19b shows that the gas injector body includes a plurality of gas outlets (252, 254, 258) adapted to supply process gas into the processing chamber. Figures 19b shows that a gas outlet (258) of the gas injector body are located at an axial end surface (258) of the gas injector body. McMillin also teaches a center gas outlet (258) extending in the axial direction and a plurality of angled gas outlets (254) extending at an acute angle to the axial direction. McMillin

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also teaches a closed distal end surface (surface housing outlet 258, Figure 19b) including gas outlets (254) that inject process gas at an acute angle relative to a plane parallel to the distal end surface. McMillin also teaches at least one O-ring seal (157; column 16, lines 11-30) providing a vacuum seal between the gas injector and the chamber wall.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's own admitted prior art to Ishii (USPat. 5,685,942), as applied to claims 25, 26, 29, 33, and 34 above, and further in view of McMillin et al (USPat. 6,013,155). Ishii does not teach an O-ring seal in a surface of a flange extending from the outer surface of the gas injector body. McMillin teaches at least one O-ring seal (157; column 16, lines 11-30) providing a vacuum seal between the gas injector and the chamber wall.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Ishii to implement the McMillin O-ring seal providing a vacuum seal between the gas injector and the chamber wall as part of a seal in a surface of Ishii's flange (85, Figure 4) extending from the outer surface of the gas injector body.

Motivation for Ishii to implement the McMillin O-ring seal providing a vacuum seal between the gas injector and the chamber wall as part of a seal in a surface of Ishii's flange (85, Figure 4) extending from the outer surface of the gas injector body is drawn to McMillin's "chamber vacuum integrity" (column 16, line 15).

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Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USPat. 6257168; 4691662; 5104634; 5252132; 6391148; 6403491.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (703) 305-1351. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official after final fax phone number for the 1763 art unit is (703) 872-9311. The official before final fax phone number for the 1763 art unit is (703) 872-9310. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (703) 308-0661. If the examiner can not be reached please contact the examiner's supervisor, Gregory L. Mills, at (703) 308-1633.


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